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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/649,991	08/27/2003	Donald V. Nicol	GTI-1533	6745
33058	7590	03/21/2005	EXAMINER	
MARK E. FEJER			HOPKINS, ROBERT A	
GAS TECHNOLOGY INSTITUTE			ART UNIT	
1700 SOUTH MOUNTAIN PROSPECT ROAD			PAPER NUMBER	
DES PLAINES, IL 60018			1724	

DATE MAILED: 03/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/649,991	Applicant(s) NICOL ET AL.	
	Examiner Robert A Hopkins	Art Unit 1724	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 7, 8 and 12-16 is/are rejected.
- 7) ☒ Claim(s) 5, 6, 9-11, 17 and 18 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>8-27-03</u> . | 6) <input type="checkbox"/> Other: ____. |

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DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Fekete(3775988).

Fekete teaches a method for processing of natural gas comprising introducing a gaseous natural gas stream comprising a mixture of hydrocarbons into a vortex tube(inlet 12n in figure 12), forming a hot fluid stream(12p) and a cold fluid stream(12o), introducing the cold fluid stream into an upper section of a distillation column(column 10 lines 41-43), and introducing the hot fluid stream into a lower section of the distillation column (column 10 lines 43-45), separating heavier hydrocarbon components from lighter hydrocarbon components disposed in the natural gas stream. Fekete further teaches wherein the mixture of hydrocarbons comprises hydrocarbons selected from the group consisting of methane, ethane, propane, butane, and natural gasoline. Fekete further teaches wherein the gaseous natural stream is introduced into a plurality of vortex tubes, wherein the vortex tubes are in sequence(see figure 12).

Claims 7,8,12 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Fekete(3775988).

Fekete teaches a system for natural gas processing comprising at least one vortex tube (figure 12, inlet 12n) having a gaseous natural gas inlet stream, a hot fluid stream outlet (12p), and a cold fluid stream outlet (12o), at least one distillation column having a hot fluid stream inlet in fluid communication with the hot fluid stream outlet and having a cold fluid stream inlet in fluid communication with the cold fluid stream outlet.

Claims 13-16 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Fekete (3775988).

Fekete teaches a method for processing a gaseous stream comprising the steps of introducing a gaseous stream comprising a mixture of components to be separated into a vortex tube, forming a hot fluid stream and a cold fluid stream, introducing the cold fluid stream into an upper section of a distillation column (column 10 lines 41-43), and introducing the hot fluid stream into a lower section of the distillation column (column 10 lines 43-45), separating heavier hydrocarbon components from lighter hydrocarbon components disposed in the natural gas stream. Fekete further teaches wherein the mixture of hydrocarbons comprises hydrocarbons selected from the group consisting of methane, ethane, propane, butane, and natural gasoline. Fekete further teaches wherein the gaseous natural stream is introduced into a plurality of vortex tubes, wherein the vortex tubes are in sequence (see figure 12).

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Fekete(3546891) teaches use of a vortex tube for separation of components of a gaseous natural gas stream.

Allowable Subject Matter

Claims 5,6,9-11,17,18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 5 recites "wherein flow of said gaseous natural gas stream through each of said vortex tubes is controlled by a plurality of pressure control valves, each of said pressure control valves connected to a vortex tube outlet of a corresponding said vortex tube". Fekete fails to teach a plurality of pressure control valves each of said pressure control valves connected to a vortex tube outlet of a corresponding said vortex tube. It would not have been obvious to someone of ordinary skill in the art at the time of the invention to provide a plurality of pressure control valves each of said pressure control valves connected to a vortex tube outlet of a corresponding said vortex tube because Fekete does not teach such a modification. Claim 6 depends on claim 5 and hence would also be allowable upon incorporation of claims 5,4, and 3 into claim 1.

Claim 9 recites "further comprising a flow control valve in fluid communication with each of said vortex tubes". Fekete fails to teach a flow control valve in fluid communication with each of said vortex tubes. It would not have been obvious to someone of ordinary skill in the art at the time of the invention to provide a flow control valve in fluid communication with each of said vortex tubes because Fekete does not

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suggest such a modification. Claims 10 and 11 depend on claim 9 and hence would also be allowable upon incorporation of claim 9 into claim 7.

Claim 17 recites "wherein flow of said gaseous stream through each of said vortex tubes is controlled by a plurality of pressure control valves, each of said pressure control valves connected to a vortex tube outlet of a corresponding said vortex tube". Fekete fails to teach a plurality of pressure control valves each of said pressure control valves connected to a vortex tube outlet of a corresponding said vortex tube. It would not have been obvious to someone of ordinary skill in the art at the time of the invention to provide a plurality of pressure control valves each of said pressure control valves connected to a vortex tube outlet of a corresponding said vortex tube because Fekete does not teach such a modification. Claim 18 depends on claim 17 and hence would also be allowable upon incorporation of claims 17,16,and 15 into claim 13.

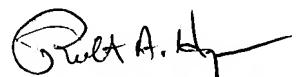
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert A Hopkins whose telephone number is 571-272-1159. The examiner can normally be reached on Monday-Friday, 7am-4pm, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on 571-272-1166. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Rah
March 16 ,2005


ROBERT A. HOPKINS
PRIMARY EXAMINER
A.U. 1724